

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2024****Subject Code:2151004****Date:27-05-2024****Subject Name:Electronics and Communication****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1**
- (a) What is modulation and list out the need of modulation? **03**
- (b) Explain the skin effect in brief. **04**
- (c) Define communication. Draw The basic block diagram of communication system explain the function of each block. **07**
- Q.2**
- (a) Define Following Terms: **03**
1. Phase Modulation 2.Modulation Index 3. Double spotting
- (b) State and prove time shifting property of Fourier transform **04**
- (c) Explain Amplitude modulation with required waveforms. Also give mathematical representation of amplitude modulated wave. **07**
- OR**
- (c) Explain Automatic Gain Control (AGC) and discuss difference between AGC and Delayed AGC. **07**
- Q.3**
- (a) Explain reason and remedy for Diagonal clipping and Negative peak clipping. **03**
- (b) Compare : Frequency modulation and Amplitude Modulation **04**
- (c) Explain the indirect method of generating FM signal with neat block diagram and relevant mathematical expressions. **07**
- OR**
- Q.3**
- (a) Explain pre-emphasis and de-emphasis in relation to FM. **03**
- (b) Discuss block diagram of filter method for SSB-SC generation. **04**
- (c) List out main functions of the communication radio receiver circuits. Also define the following terms related to radio receiver: (1) Selectivity (2) Fidelity (3) Sensitivity. **07**
- Q.4**
- (a) What is the difference between SSB and VSB wave? **03**
- (b) State Parseval's theorem. **04**
- (c) Enlist at least four FM demodulator circuits. Also describe working of Foster-Seeley discriminator with required details. **07**
- OR**
- Q.4**
- (a) Describe the significance of synchronous product detector in SSB demodulation process. **03**
- (b) Explain the trapezoidal method for monitoring the A.M waveform using oscilloscope in detail. **04**
- (c) Draw block diagram of Super-heterodyne receiver and explain the functionality of its each block with necessary details. **07**
- Q.5**
- (a) Derive the general Friis's formula to define noise factor of cascaded amplifiers. **03**
- (b) Explain Phased Lock Loop with all necessary details. **04**
- (c) List out different types of noise existing during the working of a **07**

communication system. Also briefly describe about shot noise, partition noise and flicker noise.

OR

- Q.5**
- (a) Explain self-capacitance of a coil. **03**
 - (b) Draw the block diagram of Tuned Radio Frequency (TRF) Receiver and explain its operation **04**
 - (c) Describe Ham radio concept with required details. Also describe the usage significance of Ham radio during the occurrence of natural calamities **07**
